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REVIEW AND FIRST NEW WORLD ENDEMIC OF THE STREPSIPTERAN GENUS *CORIOXENOS* BLAIR (STREPSIPTERA: CORIOXENIDAE: CORIOXENINAE)

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Abstract.—***Corioxenos acucyrtophallus*, n. sp.**, described from two males collected in Chiapas, Mexico, represents the first endemic new world species of the genus. A female *Corioxenos* is reported from its host in Vera Cruz, Mexico, but is left undescribed because it is not possible to determine if it is the female of *C. acucyrtophallus* n. sp. or if it represents a new species. A key to the *Corioxenos* species is given and wing venation terminology of *Corioxenos* is discussed.

Key Words: taxonomy, key, wing morphology, *Corioxenos,* Pentatomidae

The genus *Corioxenos* Blair is a small group of Strepsiptera characterized by males having seven antennal segments, with lateral flabella on the third and fourth segments; four segmented tarsi, with the apical segment short, bilobed, and without claws; mandibles absent; aedeagus without an apical hook; and hind wings with detached veins. However, all of these characters were not correctly diagnosed in the original generic description (Blair 1936). Blair considered the antennae to be "five-jointed," but Kinzelbach (1972) correctly diagnosed the antennae as seven-segmented. Furthermore, Baliga (1967) mistakenly described *Corioxenos raoi* as having three segmented tarsi, although the habitus drawing clearly shows four tarsal segments. Baliga also misdiagnosed the number of antennal segments as being five instead of seven. Females are characterized as having an elongated cephalothorax oriented such that its ventral side is towards the host; narrow brood canal opening in the head region of the cephalothorax; rudiments of ommatidia on the cephalothorax; and abdomen with eight dorsal papillae (Kathirithamby 1989). All known hosts are in the heteropteran family Pentatomidae.

Previously, only two species of *Corioxenos* have been described. *Corioxenos antestiae* Blair was described from male, female, and triungulin specimens associated with *Antestia lineaticollis* Stål from the slopes of Kilimanjaro, Tanganyika (Blair 1936). Kinzelbach (1971) listed *Antestia faeceta* Germar as another host of *C. antestiae,* and Kinzelbach (1971) reported *C. antestiae* from the Dominican Republic, but inferred that it was not native to that area. Kathirihamby (1992) reported the same distribution, with no further explanation. A second species, *C. raoi* Baliga, was described from male, female, and triungulin specimens associated with *Antestiopsis cruciata* (Fabricius) from around Bangalore, India (Baliga 1967).

Here I describe the first *Corioxenos* species endemic to the Western Hemisphere from two males collected in Chiapas, Mexico. I also report on a female *Corioxenos* that may be the female of this newly de-

scribed species. However, there is not enough evidence at this time to consider it conspecific. Along with the new species description, a key to all species of *Corioxenos* males is provided.

KEY TO SPECIES OF *CORIOXENOS* MALES

1. R_2 and R_3 subequal in length (Fig. 9); aedeagus almost twice as long as first tarsal segment; Mexico ..... *C. acucyrtophallus*, n. sp.
– R_2 much shorter than R_3; aedeagus length about equal to first tarsal segment 2
2. Aedeagus begins tapering at about ⅓ its length from base; maxillary palp ½ as long as 5th antennal segment; flagella of antennal segments 3 and 4 subequal to 5 + 6 + 7; Tanganyika, Dominican Republic ..... *C. antestiae*
– Aedeagus begins tapering at over ½ its length from base; maxillary palp ⅓ as long as 5th antennal segment; antennal segment 3 shorter that 4, both 3 and 4 shorter than 5 + 6 + 7; India ..... *C. raoi*

Corioxenos acucyrtophallus Cook, new species
(Figs. 1–4, 9)

Male description.—Body coloration: heavily sclerotized regions of head and thorax golden-brown to brown, other regions tan. Total body length 2.2 to 2.4 mm. Head rectangular, strongly transverse, enlarged somewhat at eyes, sclerites as in Fig. 1. Head width including eyes 0.56 mm; distance between eyes 0.45 mm. Antenna with flabellum on segments IV and V; segments I and II with pubescent hairs; segments III–VII with pubescent hairs and sensory cups. Length of antennal segments, including flabellum where present (mm.): I = 0.05, II = 0.05, III = 0.62, IV = 0.58, V = 0.38, VI = 0.07, VII = 0.25. Mouthparts: only maxillary palp present, 2-segmented, second segment tapering to sharp point, I = 0.10 mm, II = 0.20 mm (Fig. 2). Thorax sclerites as in Fig. 1; pronotum narrow, transverse; mesonotum irregular-shaped; metascutum-prescutum rounded anteriorly; prealar triangular; scutellum triangular, much longer than wide; postscutellum elongate, rounded posteriorly; trapezoidal membrane between scutellum and postscutellum. Fore wing club-shaped with R half way to apex. Hind wing (Fig. 9) smoky brown, no veins extending to wing margin; Sc extending half way to wing margin or less; R_1 extending ¾ to wing margin; R_2 beginning posterior to and near apex of R_1; extending to near wing margin; R_3 with distinct bend, subequal to R_2; R_4 extending about ¾ to wing margin; R_5 beginning posterior and just prior to end of R_4; M extending to near wing margin; CuA_1 extending about ¼ to wing margin; CuA_2 extending about ⅔ to wing margin; CuP near wing posterior, extending to near ½ wing margin. Leg shapes and relative lengths as in Fig. 4; prothoracic and mesothoracic femora grooved laterally such that tibiae will be held in grooves when folded; prothoracic and mesothoracic femora subequal in length to corresponding tibiae; metathoracic femur L-shaped, shorter than metathoracic tibia; tarsi 4-segmented on all legs; 1st tarsal segment without circular sensory spot; 2nd tarsal segment with sensory spot near base; 3rd and 4th tarsal segments with sensory spot on directed opposite of sensory spot on 2nd tarsal segment, located in middle of segment; 4th tarsal segment bilobed and without claws. Abdomen as in Fig. 1. Aedeagus thin and gradually tapering from base to sharp apex; curved convexly in lateral view (Fig. 3).

Female.—Unknown.

Larva.—Unknown.

Diagnosis.—*Corioxenos acucyrtophallus* can be easily distinguished from both *C. antestiae* and *C. raoi* by the length relationship of the R_2 and R_3 wing veins (Fig. 9), shape of the aedeagus (Fig. 3), and general shape of the thoracic tergites. In *C. acucyrtophallus*, R_2 and R_3 are subequal in length (Fig. 9), while in *C. antestiae* and *C. raoi* R_2 is less than half as long as R_3 (Figs. 5–8). The R_3 vein of *C. acucyrtophallus* is distinctly bent, while this vein is straight in both *C. antestiae* and *C. raoi*. The aedeagus of *C. acucyrtophallus* is long and needle-like, tapering gradually from the base to the apex (Fig. 3). The aedeagus of *C. antestiae* and *C. raoi* begin tapering some distance

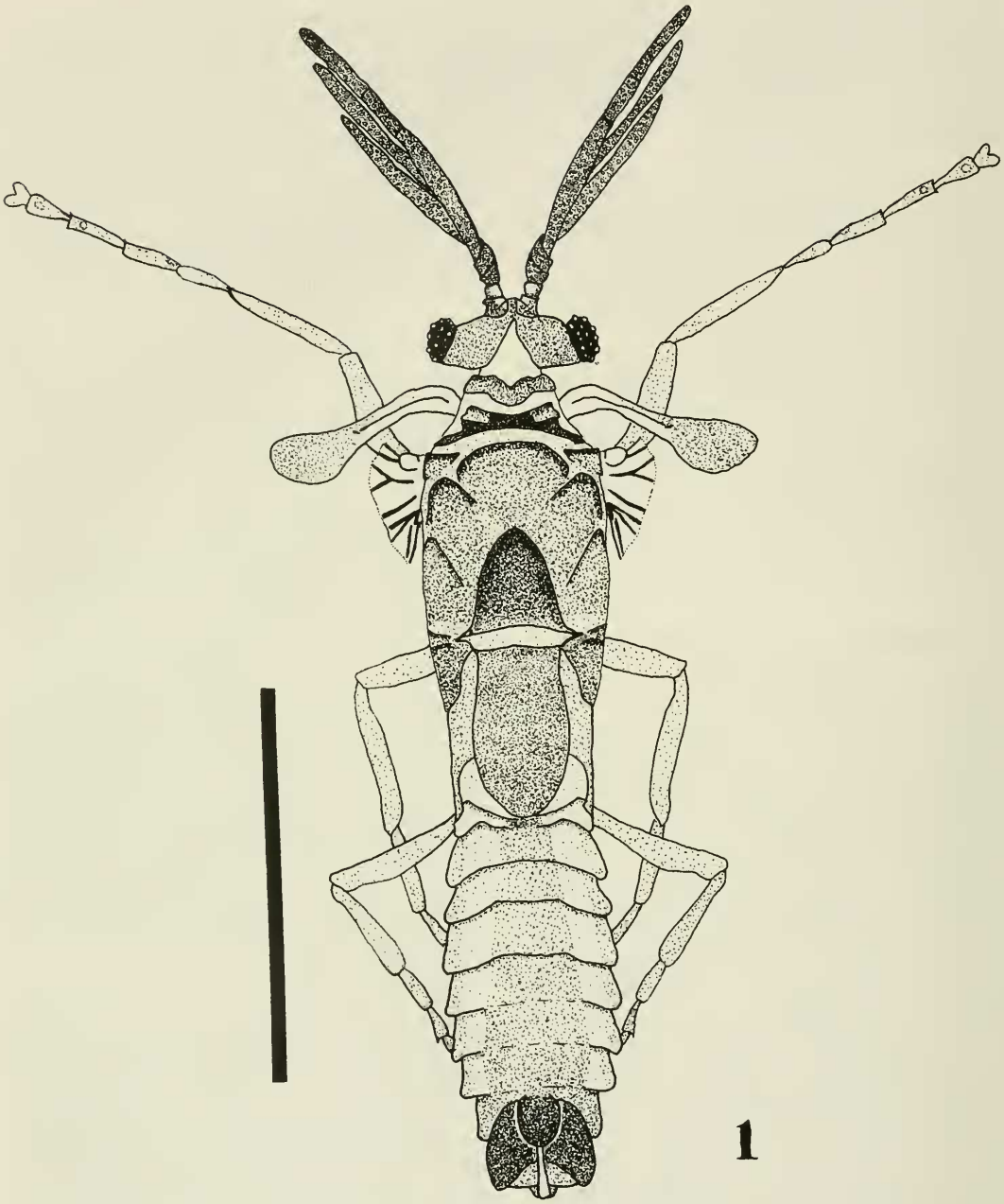

Fig. 1. *Corioxenos acucyrtophallus*, adult male, habitus. Scale bar = 1.0 mm.

from the base, at about ⅓ its length in *C. antestiae* and at about ½ its length in *C. raoi*. The differences in general shapes of the thoracic tergites between the *Corioxenos* species is most apparent in the scutellum and postscutellum. In *C. acucyrtophallus*, these tergites are relatively longer than those of *C. antestiae* and *C. raoi*. In general, the two Old World species have characters that are much more similar to each other than to *C. acucyrtophallus*.

Etymology.—The specific epithet is de-

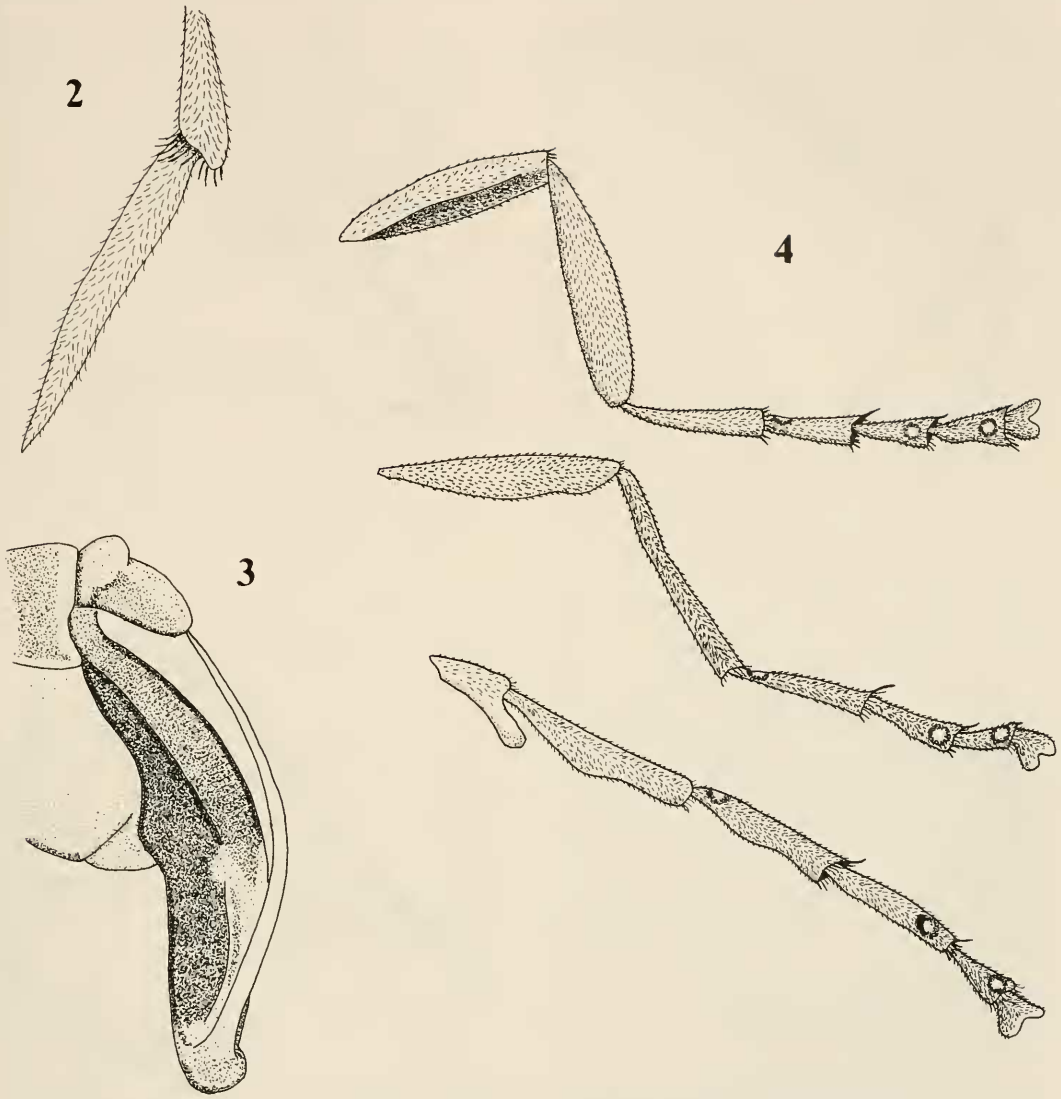

Fig. 2–4. *Corioxenos acucyrtophallus*. 2, Maxillary palps. 3, Aedeagus and genital capsule. 4, From top to bottom, prothoracic leg, mesothoracic leg, and metathoracic leg.

scriptive of the aedeagus using the Greek roots "acu" = needle, "cyrto" = curved, convex, and "phallus" = the penis.

Holotype.—♂, Mexico, Chiapas, Mpio. San Cristobal, Reserva Huitepec, 7,860′, 16°46′06″N; 92°41′04″W, 2–14 VIII 1997, Woolley, González, and Galdámez, Malaise trap 97/068. Deposited in Colección Entomológica, El Colegio de la Frontera Sur (ECOSUR).

Paratype.—1 ♂, Mexico, Chiapas, Mpio. San Cristobal, Reserva Huitepec, 8,160′, 16°46′06″N; 92°41′04″W, 2–14 VIII 1997, Woolley, Galdamez, & González, Malaise trap 97/070. Deposited in the Museum of Entomology, Texas A&M University.

Corioxenos sp.

A female of a *Corioxenos* species was collected by A. R. Gillogly in Veracruz, Mexico, in 1997. This specimen was collected in a species of *Edessa* (Pentatomi-

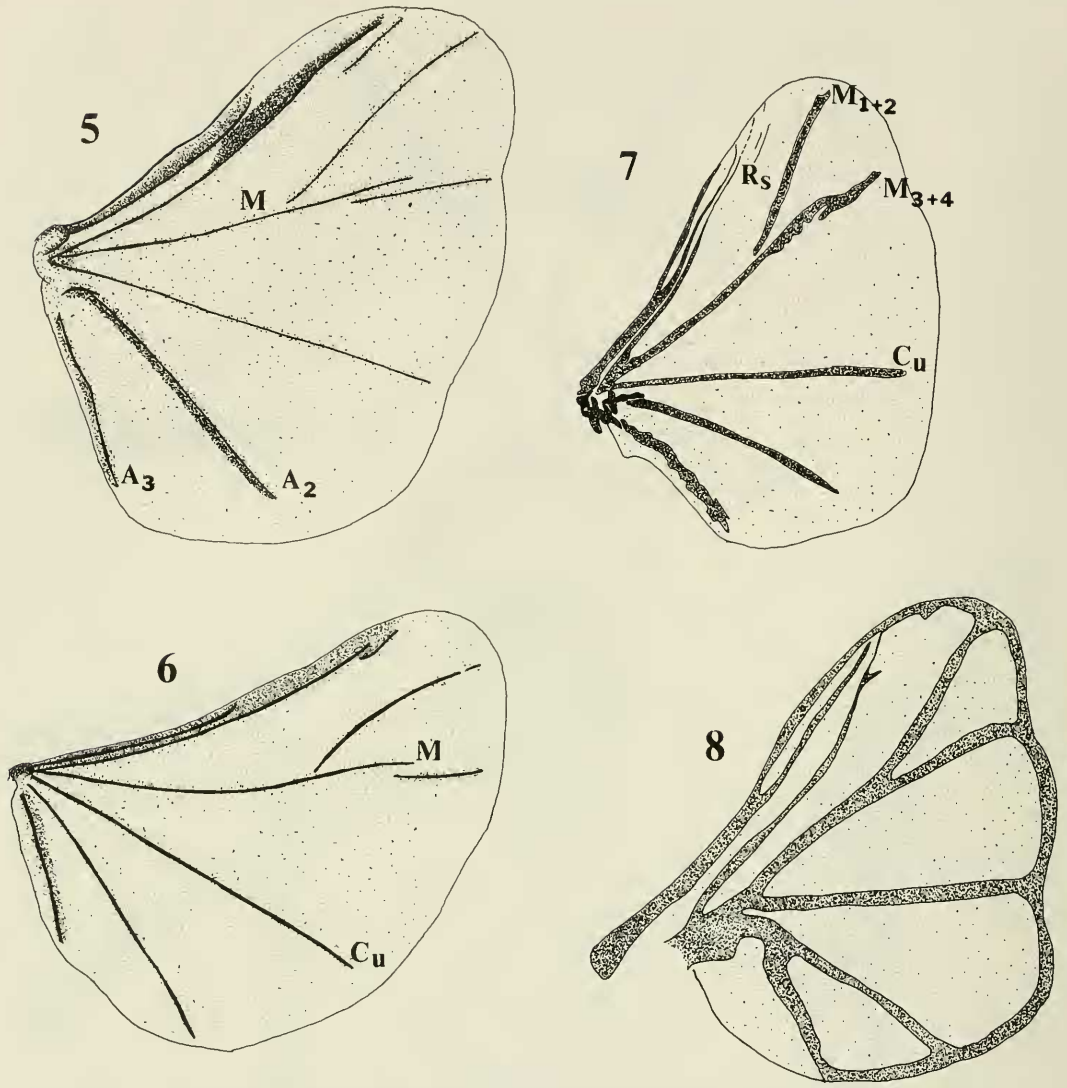

Fig. 5–8. *Corioxenos* hindwing veins, as originally labeled. 5, *C. antestiae* redrawn from Blair (1936). 6, *C. raoi* redrawn from Beliga (1967), 7, *C. antestiae* redrawn from Cooper (1938). 8, *C. antestiae* redrawn from Kinzelbach (1971).

dae), 8 km south east of Monte Pio and can be identified as *Corioxenos* using the key published by Miyamoto and Kifune (1984). However, the only evidence that this is the female to *C. acucyrtophallus* is that they both were collected in southern Mexico, and no other species of *Corioxenos* is known from that area of the New World. Due to these circumstances, I choose not to describe this specimen as a new species at this time, thus eliminating the possibility of erecting a possible synonym, or incorrectly associating it with the males described here. The specimen is deposited in the collection of Jerry Cook.

Corioxenos Wing Veination

There is considerable discrepancy in the labeling of veins in *Corioxenos* wings. Blair (1936) described *C. antestiae* as having "wings with median vein forked distally, the branch detached." From the figure that

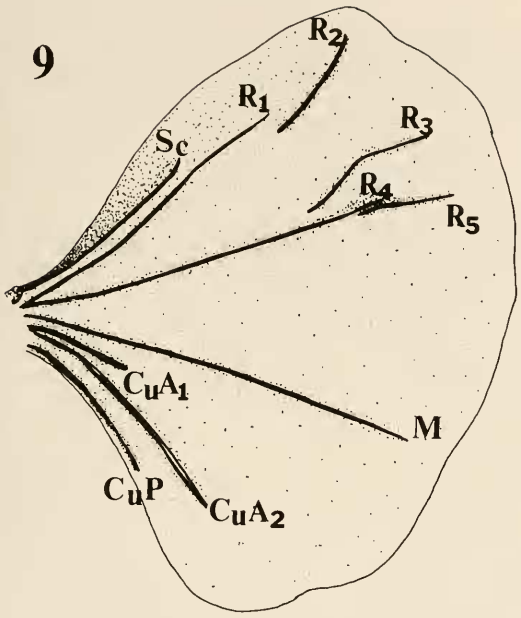

Fig. 9. Hindwing of *Corioxenos acucyrtophallus*.

accompanies his description (redrawn in Fig. 5), it is clear that he was referring to the radial vein, specifically R_3 and R_4. Blair also described a third anal vein "lying close to the inner margin," which should be designated as CuP. Baliga (1967) also considered part of the radial vein, R_4, to be the medial vein (redrawn in Fig. 6). Baliga did not designate the detached radial veins as being radial or medial, and named R_5 as simply another detached vein. Baliga labeled the vein now considered to be M as Cu and followed Blair's naming of the remaining posterior veins. Cooper (1938) gave a different diagnosis of the wing veins (redrawn in Fig. 7) and designated what I now consider R_2 as the radial sector. He joined veins R_3 and R_4 and called this vein M_{3+4}. The detached vein was designated as M_{1+2}. The other posterior veins were then given an improper designation of Cu, 2nd A and 3rd A, respectively. Cooper's diagnosis was made using a wing "about half way through the pupal stadium." Kinzelbach (1971) attempted to straighten out this terminology, labeling the pupal wing drawing of *C. antestiae* as drawn by Cooper (1938) for his diagnosis (redrawn in Fig. 8). This pupal wing did not show the development of R_2, the differentiation of CuA_1 and CuA_2, or the presence of CuP. This pupal wing also did not show any of the veins as yet detached, but aids in showing that the radial veins that are detached in the adult wing are truly radial veins.

Part of the confusion of wing vein designation may have arisen from the difficulty in seeing the origin of the wing veins. Blair (1936) and Beliga (1967) did not clearly show the origin of veins, and Cooper (1938) drew veins with a combined origin in places where they are clearly separated. The specimens used to describe C. acucyrtophallus being in pristine condition facilitated the correct designation of wing veins that I propose. The origins of all veins are clearly seen in both the holotype and paratype. Therefore, species of *Corioxenos* have five radial veins, three of which are detached in the adult wing. The next vein, posteriorly, is designated as M because it has a separate origin. Kinzelbach (1971) labeled this vein as MA, but since there is no evidence of any other medial veins, it seems inappropriate to designate it as the anterior medial. The next two veins have a common origin and are designated CuA_1 and CuA_2 respectively. The posterior most vein has a separate origin and is thus designated as postcubitus, CuP. This new diagnosis is shown in the wing of *C. acucyrtophallus* shown in Fig. 9.

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